Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

# BDE PROCEDURE MEMORANDUM

**NUMBER: 37-03**

**SUBJECT: Documenting Microscale Analysis Information**

**DATE: October 14, 2003**

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This memorandum supersedes the guidance on "Microscale Analysis" contained in Sections 23-2.02(e), 24-3.07(e), and 25-3.09(e) of the *BDE Manual 2002*. The information in this memorandum will be incorporated in the manual in a future update.

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## BACKGROUND

A new version 2.0 of the Illinois Carbon Monoxide (CO) Screen for Intersection Modeling (COSIM) was issued in May 2003. The update to COSIM reflects significant changes that have occurred in MOBILE 6, the current update of the USEPA vehicle fleet emissions model, including new emission rates, driving patterns, correction factors, fleet composition, and regulatory impacts. COSIM 2.0 includes a Pre-screen feature that replaces the 16,000 ADT criterion previously used for screening IDOT projects for CO microscale analysis purposes. The IDOT/IEPA Agreement on Microscale Air Quality Assessments has recently been updated to formally recognize the use of the COSIM Pre-screen feature for evaluating IDOT projects and to make other associated revisions. This memorandum revises the procedures for documenting CO microscale analysis information in project environmental documentation to reflect changes in COSIM version 2.0 and the IDOT/IEPA agreement.

## APPLICABILITY

These procedures are applicable to State highway projects that are processed with Environmental Impact Statements or Environmental Assessments, that are processed under the Environmental Class of Action Determination (ECAD) procedures, and projects for which the environmental documentation is prepared in accordance with Section 22-2.05(b) of the *BDE Manual 2002*. These procedures also apply to other State highway projects processed as categorical exclusions if the projects involve addition of through lanes or auxiliary turning lanes.

## PROCEDURES

The documentation requirements described below pertain to the "Microscale Analysis" topic in the Air Quality portion of the environmental consequences discussion for applicable projects.

### Projects That Do Not Add Through Lanes or Auxiliary Turning Lanes

Under the terms of the IDOT-IEPA "Agreement on Microscale Air Quality Assessments for IDOT Sponsored Transportation Projects", projects that do not add through lanes or auxiliary turning lanes are exempt from the requirement for a microscale CO analysis. For projects that qualify for this exemption, enter the following statement in the environmental consequences section:

> *In accordance with the IDOT-IEPA "Agreement on Microscale Air Quality Assessments for IDOT Sponsored Transportation Projects", this project is exempted from a project-level carbon monoxide air quality analysis because it does not add through lanes or auxiliary turning lanes.*

### Projects Involving No Sensitive Receptors and Projects Not Suitable for Use of COSIM 2.0

For projects that will add through lanes or auxiliary turning lanes but that either have no "sensitive" receptors (as defined in the COSIM 2.0 User's Manual) within 1000 feet of any intersection, or that do not fit the assumptions for use of the COSIM model (see User's Manual), contact the BDE Air Quality Specialist regarding evaluation of the need for further air quality modeling for CO and the documentation to include in the environmental consequences section of the environmental document or in the ECAD Record or Phase I Engineering Report.

### Projects Subject to COSIM Pre-Screen

For projects that will add through lanes or auxiliary turning lanes and that fit the assumptions for use of the COSIM program, the first step in the microscale CO analysis process will be to use the Pre-screen feature in version 2.0 of COSIM to determine whether further air quality modeling is needed. If the project "passes" the Pre-screen (i.e., "worst case" assumptions indicate the project will not exceed the Carbon Monoxide NAAQS), enter the following statement in the environmental consequences section, ECAD Record, or Phase I Engineering Report, as appropriate:

> *A Pre-Screen analysis was completed for the proposed project. The results from this proposed roadway improvement indicate that a COSIM air quality analysis is not required, as the results for the worst-case receptor are below the 8-hour average National Ambient Air Quality*

*Standard for CO of 9.0 ppm which is necessary to protect the public health and welfare.*

(Note: On projects where this finding applies, the printout of the COSIM Pre-Screen Modeling Results generated by the COSIM program will include the preceding paragraph. This printout can be included in Phase I Engineering Reports to provide the necessary documentation that a COSIM air quality analysis is not required.)

**Projects Subject to COSIM Screening Analysis**

If the project "fails" the Pre-screen, a complete COSIM screening analysis should be conducted as the next step in the microscale CO analysis process. The COSIM analysis will indicate whether further detailed air quality analysis is needed. If the COSIM analysis indicates that the project "passes" (i.e., does not have the potential for causing a violation of the NAAQS for CO for any affected receptors), further detailed air quality analysis is not required. Complete and include the following paragraphs in the environmental consequences section:

*The air quality effects of the proposed project were analyzed using the Illinois Carbon Monoxide Screen for Intersection Modeling (COSIM). The "worst case" analysis provided by the COSIM model indicated that the proposed undertaking does not have the potential for contributing to a violation of the National Ambient Air Quality Standards for CO. CO concentrations for the worst case receptor (i.e., residence) located [_____] (see Exhibit [__]) were as follows:*

*Existing ([year]) - ___ ppm; Build – Time of Completion (TOC) ([year]) - ___ ppm, TOC + 10 years ([year]) - ___ ppm, and Design Year ([year]) - ___ ppm; No Action - ___ ppm in [TOC year], ___ ppm in [TOC + 10 year], and ___ ppm in [Design Year].*

**Projects Subject to Detailed Project-Level CO Analysis**

If the COSIM screening analysis indicates the project "fails" (i.e., that it has potential for contributing to a violation of the NAAQS for CO), or if the project does not fit the assumptions for use of the COSIM screening analysis, a detailed project-level CO analysis should be performed and documented. Districts should use the latest USEPA Mobile and air quality dispersion models, and should contact the BDE Air Quality Specialist for guidance on the latest inputs and modeling information. The results should be documented as described below:

For projects processed under the ECAD procedures, the findings of the detailed analysis should be documented by completing and including the following paragraphs in the ECAD Record.

*A Carbon Monoxide (CO) analysis was completed for the worst case receptor (i.e., residence) located [ _____ ] (see Exhibit [ ___ ]). Calculated CO concentrations were as follows:*

*Existing ([year]) - ___ ppm; Build – Time of Completion (TOC) ([year]) - ___ ppm, TOC + 10 years ([year]) - ___ppm, and Design Year ([year]) - ___ ppm; No Action - ___ ppm in [TOC year], ___ ppm in [TOC + 10 year], and ___ ppm in [Design Year].*

If the results for an ECAD project are below the 8-hour CO NAAQS, also include the following statement:

*The results from this roadway improvement indicate that concentrations are below the 8-hour National Ambient Air Quality Standard of 9.0ppm which is necessary to protect the public health and welfare.*

If the results of the detailed analysis for an ECAD project exceed the 8-hour CO NAAQS, mitigation measures must be discussed with FHWA, USEPA, and IEPA. The District should contact the BDE Air Quality Specialist to initiate the necessary contacts with those agencies. Any such mitigation measures that will be incorporated in the project should be summarized in the ECAD Record.

For projects processed with an Environmental Assessment or Environmental Impact Statement, and for environmental documentation in Phase I Engineering Reports for applicable projects, the worst-case location and calculated eight-hour results of the detailed project-level CO analysis should be described in the environmental consequences section. Districts should contact the BDE Air Quality Specialist for guidance on documenting the results. Comparison of these results to the NAAQS for CO will determine whether the project supports the maintenance of the CO NAAQS in Illinois. Analysis results below the eight-hour CO NAAQS (less than 9 ppm) will indicate no impacts to the local atmospheric conditions that are necessary to protect the public health and welfare. Analysis results above the eight-hour CO NAAQS will indicate impacts that will require discussion of mitigation measures with FHWA, USEPA, and IEPA. Any such mitigation measures should be described in the environmental consequences section.

Engineer of Design and Environment Michael L. Hine